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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TSANG FOSTER, SUSY N

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 11/30/2001

6

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/582,432

Applicant(s)

KATSURAO ET AL.

Examiner

Susy N Tsang

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-9 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 and 5. 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Objections***

2. Claims 7 and 9 are objected to because of the following informalities:

The Markush group is improperly written in claim 7. It is advised to the applicants to rewrite the Markush group as “selected from the group consisting of polyamines, polyols, polymerizable crosslinking agents having an unsaturated bond, and a radical generating agent”.

In claim 9, the limitation “a negative electrode comprising negative electrode material similarly capable of being doped with and liberating lithium or metallic lithium” is grammatically awkward since it appears from this limitation that the negative electrode material is capable of doping/dedoping metallic lithium which is not possible. It appears applicants intended to claim “a negative electrode comprising either metallic lithium or a negative electrode material similarly capable of being doped with and liberating lithium”.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1745

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, the limitation “charging the monomers simultaneously” is indefinite because it is unclear to the examiner what this limitation means. It is unclear how the monomers are charged and the Examiner would appreciate clarification from the applicants.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-6, 8, and 9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 730316 A1.

The process limitation "obtained by charging the monomers simultaneously and then polymerizing the monomers" is not given patentable weight in product claim 3.

EP 730316 A1 discloses a nonaqueous battery comprising a positive electrode comprising a positive electrode material capable of doping and dedoping (liberating) lithium, a negative electrode comprising either metallic lithium or a negative electrode material capable of doping and dedoping (liberating) lithium, and a polymer electrolyte between the positive electrode and the negative electrode (page 13, lines 40-50).

The polymer for the polymer electrolyte can be a copolymer of vinylidene fluoride and hexafluoropropylene with about 7 to about 25% hexafluoropropylene by weight (page 4, lines 30-35) which implies about 93 to about 75 weight % being vinylidene fluoride in the copolymer.

The copolymer may be crossed linked with radiation using a high energy electron beam (page 4, last line).

Since the weight ratio of vinylidene fluoride and hexafluoropropylene used in the copolymer overlaps extensively with that claimed by applicants for a copolymer of vinylidene fluoride and a monomer polymerizable with vinylidene fluoride (that is, 80 to 97 wt% vinylidene fluoride and 3 to 20 weight% of at least one monomer copolymerizable with vinylidene fluoride), the properties cited in the instant claims (viscosity of 1.5 to 10 dl/g, abnormal linkage content of at least 3% at vinylidene fluoride sites, absorption from 50 to 85 wt% of the nonaqueous electrolytic solution) are inherent in the copolymer of EP 730316 A1.

Art Unit: 1745

When the Examiner has reason to believe that functional language (in this instance, the inherent properties of viscosity of 1.5 to 10 dl/g, abnormal linkage content of at least 3% at vinylidene fluoride sites, absorption from 50 to 85 wt% of the nonaqueous electrolytic solution of the copolymer) asserted to be critical for establishing novelty in claimed subject matter may, in fact be an inherent characteristic of the prior art as discussed above, the burden of proof is shifted to the applicant to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

8. Claims 1, and 3-9 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mitchell et al. (US Pat. No. 6,077,624).

Mitchell et al. disclose a nonaqueous battery comprising a positive electrode comprising a positive electrode material capable of doping and dedoping (liberating) lithium, a negative electrode comprising a negative electrode material capable of doping and dedoping (liberating) lithium, and a polymer electrolyte between the positive electrode and the negative electrode (col. 1, lines 33-48). The polymer electrolyte can be a copolymer of vinylidene fluoride and hexafluoropropylene with the hexafluoropropylene content less than 10 mole percent (col. 8, lines 30-35) which corresponds to about greater than 79 weight percent of vinylidene fluoride with the remaining amount in the copolymer being hexafluoropropylene (col. 7, lines 55-57) which would be approximately less than 20 weight percent of hexafluoropropylene and being greater than zero percent (col. 8, lines 62-67) which overlaps with the range of 3 to 20 weight percent of the monomer copolymerizable with vinylidene fluoride in claim 1.

The copolymer of vinylidene fluoride and hexafluoropropylene can be crosslinked by a polyhydroxylic aromatic crosslinking agent (col. 2, lines 35-40) or by a variety of crosslinking agents that are known in the art for vinylidene fluoride based copolymers (col. 12, lines 59-64).

Since the weight ratio of vinylidene fluoride and hexafluoropropylene used in the copolymer is nearly identical to that claimed by applicants for a copolymer of vinylidene fluoride and a monomer polymerizable with vinylidene fluoride (that is, 80 to 97 wt% vinylidene fluoride and 3 to 20 weight% of at least one monomer copolymerizable with vinylidene fluoride), the properties cited in the instant claims (viscosity of 1.5 to 10 dl/g, abnormal linkage content of at least 3% at vinylidene fluoride sites, absorption from 50 to 85 wt% of the nonaqueous electrolytic solution) are inherent in the copolymer of Mitchell et al.

When the Examiner has reason to believe that functional language (in this instance, the inherent properties of viscosity of 1.5 to 10 dl/g, abnormal linkage content of at least 3% at vinylidene fluoride sites, absorption from 50 to 85 wt% of the nonaqueous electrolytic solution of the copolymer) asserted to be critical for establishing novelty in claimed subject matter may, in fact be an inherent characteristic of the prior art as discussed above, the burden of proof is shifted to the applicant to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

9. Claims 1, and 3-9 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gozdz et al. (US 5,429,891).

Gozdz et al. ('891) disclose a nonaqueous battery comprising a positive electrode comprising a positive electrode material capable of doping and dedoping (liberating) lithium, a negative electrode comprising a negative electrode material capable of doping and dedoping

Art Unit: 1745

(liberating) lithium, and a polymer electrolyte between the positive electrode and the negative electrode (col. 1, lines 15-20 and lines 64-65).

The polymer for the polymer electrolyte can be a copolymer of vinylidene fluoride and hexafluoropropylene with about 8 to about 25% hexafluoropropylene by weight and with about 75 to about 92 wt % being vinylidene fluoride and the copolymer can retain about 40 to about 60 % of the electrolytic solution (col. 6, lines 31-40).

The copolymer of vinylidene fluoride and hexafluoropropylene can be crosslinked in the presence of an acrylate ester, a di- or triallyl ester, and a di- or triglycidyl ether (col. 3, lines 40-45) and electron beam radiation (col. 5, lines 20-25).

Since the weight ratio of vinylidene fluoride and hexafluoropropylene used in the copolymer overlaps extensively with that claimed by applicants for a copolymer of vinylidene fluoride and a monomer polymerizable with vinylidene fluoride (that is, 80 to 97 wt% vinylidene fluoride and 3 to 20 weight% of at least one monomer copolymerizable with vinylidene fluoride), the properties cited in the instant claims (viscosity of 1.5 to 10 dl/g, abnormal linkage content of at least 3% at vinylidene fluoride sites) are inherent in the copolymer of Gozdz ('891).

When the Examiner has reason to believe that functional language (in this instance, the inherent properties of viscosity of 1.5 to 10 dl/g, abnormal linkage content of at least 3% at vinylidene fluoride sites) asserted to be critical for establishing novelty in claimed subject matter may, in fact be an inherent characteristic of the prior art as discussed above, the burden of proof is shifted to the applicant to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.



***Allowable Subject Matter***

10. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

The present invention claims a polymer electrolyte comprising a vinylidene fluoride copolymer and a nonaqueous electrolytic solution and the vinylidene fluoride copolymer comprises 80 to 97 wt% of vinylidene fluoride monomer units and 3 to 20 wt % of a mixture of hexafluoropropylene monomer and trifluorochloroethylene monomer (applies to claim 2).

The closest prior art of record, Gozdz et al. (US Pat. No. 5,571,634) disclose a nonaqueous battery comprising a polymer electrolyte comprising a copolymer of vinylidene fluoride and chlorotrifluoroethylene where the chlorotrifluoroethylene is present about 8 to 20% by weight (col. 6, lines 29-35) but does not disclose, teach, or suggest a polymer electrolyte comprising a copolymer of vinylidene fluoride, chlorotrifluoroethylene and hexafluoropropylene where the total amount of chlorotrifluoroethylene and hexafluoropropylene in the copolymer is 3 to 20% by weight of the copolymer.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang, Ph.D. whose telephone number is (703) 305-0588. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.


Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gabrielle Brouillette, Ph.D. can be reached at (703) 308-0756. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9310 for regular communications and (703) 872-9311 for After-Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

st/19 November 2001

  
GABRIELLE BROUILLETTE  
SUPERVISORY PATENT EXAMINER  
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